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NATIONAL SECURITY COUNCIL
WASHINGTON, D.C. 20506

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October 25, 1986

MEMORANDUM FOR:

MR. NICHOLAS PLATT
Executive Secretary
Department of State

COLONEL JAMES F. LEMON
Executive Secretary
Department of Defense

MR. WILLIAM VITALE
Executive Secretary
Department of Energy

MR. L. WAYNE ARNY
Associate Director for
National Security and
International Affairs
Office of Management and
Budget

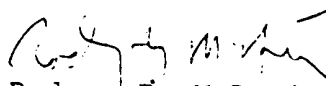
✓ MR. JOHN H. RIXSE
Executive Secretary
Central Intelligence Agency

DR. JONATHAN F. THOMPSON
Executive Assistant to the
Director
Office of Science and
Technology Policy

SUBJECT: Fusion Cooperation with the USSR, Japan, and
Western Allies (S)

The attached DOE proposal and implementation program fulfills the agreement made by the President and General Secretary Gorbachev at the Geneva Summit regarding cooperation on fusion research. As provided for in NSDD 209, DOE should take the operational lead in proceeding with the implementation program as soon as possible. The Department of State will work closely with DOE to ensure proper coordination of the implementation program with Japan, Western Allies, and the Soviet Union. In addition, to improve the prospects of a multilateral agreement on fusion, Japan and the Western Allies should be notified prior to communicating the proposal to the Soviet Union. (S)

Regarding technology transfer concerns, all COCOM constraints will be met. Since the DOE proposal provides only for the development of a conceptual design, no important technology transfer problems are expected. The NSC-chaired fusion working group will meet periodically to review progress on the proposal and implementation program, including any of the agency member's concerns regarding the unauthorized transfer of sensitive technology. (S)


Rodney B. McDaniel
Executive Secretary

Attachment
Tab A DOE proposal

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Department of Energy
Washington, DC 20585

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October 22, 1986

MEMORANDUM FOR Rodney B. McDaniel
Executive Secretary
National Security Council

By this memorandum, a copy of "United States Proposal for Enhanced International Collaboration in Fusion (S)" is transmitted for the attention of Admiral John Poindexter. This document outlines the situation with respect to possible future collaboration with the Soviet Union and our Western Allies. It has been developed under the auspices of a National Security Council (NSC) Working Group on Fusion, chaired by Lucian Pugliese of the NSC staff. This final document has been coordinated with each of the following agencies: the Department of Defense, the Department of State, the National Security Council, the Office of Science and Technology Policy, the Central Intelligence Agency and the Office of Management and Budget.

William V. Vitale

William V. Vitale
Director, Executive Secretariat

Enc.

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A. Trivelpiece

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This document consists of 11 pages.
No. 2 of 6 copies, Series B

UNITED STATES PROPOSAL
FOR ENHANCED INTERNATIONAL COLLABORATION IN FUSION

October 22, 1986

DOCUMENT TRANSMITTED
HEREIN CONTAINS
NATIONAL SECURITY INFORMATION

Director A. Trivelpiece
(S&IC and SEC)

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A US Proposal for Enhanced International Collaboration in Fusion

Background

President Reagan and General Secretary Gorbachev agreed in Geneva to advocate "the widest practicable development of international cooperation in" obtaining the beneficial use of magnetic fusion energy. Since the Geneva Summit, the United States has considered this matter and has consulted with its Western Allies and with the Soviet Union on the best means to implement this agreement. On the basis of these consultations, the U.S. has formulated a proposal for intensification of international fusion collaboration.

Shortly after the Geneva Summit, the Economic Summit Members' Fusion Working Group met, and on the basis of current progress in fusion research, developed a consensus on the common mid-term goal for all their fusion programs. This goal is to complete the scientific base for fusion and to establish its technical feasibility. To this end, an Engineering Test Reactor (ETR) is considered to be an important step. Discussions at the IAEA's International Fusion Research Council and at a US/USSR bilateral meeting in Geneva affirmed that this consensus is shared by the Soviet Union.

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In the past, the world's fusion programs have devoted considerable efforts to develop the technical base for this essential step. For the past seven years, an international effort to define an ETR like device, called INTOR, has been conducted under IAEA auspices. INTOR is an acronym for International Tokamak Reactor. This joint effort has defined both a candidate ETR and the necessary supporting research required to resolve critical design issues. This activity has produced an increased level of understanding and an excellent base for further development of fusion cooperation.

Motivation

However, even with substantial agreement on the nature of the ETR based on the detailed technical results of the INTOR activity, there still is not sufficient agreement on a common set of characteristics or on a single technical design. In fact, there are four candidates for major next stage experimental devices being developed by the EC, Japan, the U.S. and the USSR in parallel with the INTOR effort. Nonetheless, it is clear that the level of agreement on the nature of the goal, its exacting technical requirements, and the high cost of such an experimental facility are ample justification for an increased effort toward developing a single design acceptable to all potential participants. In order to increase the chances of successful international collaboration on this device which is necessary for progress in all of the world's fusion programs, the U.S. has formulated the following proposal.

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Proposal

The United States proposes that the European Communities, Japan, the USSR and the U.S. join together to produce one technically acceptable design for the essential next step in the world fusion program, through the effective unification of our design efforts and supporting research. This design effort would be coordinated through mechanisms already established in the IAEA for the INTOR activity.

The United States is prepared to participate in an effort to define a set of technical characteristics and to prepare a single conceptual design report for an Experimental Test Reactor that are acceptable to all participants. Consistent with the joint statement on fusion at Geneva, the U.S. is prepared to commit sufficient resources through its national program to support achievement of this goal within three years.

This proposed effort should provide a level of detail sufficient to prepare any nation, or group of nations, for subsequent decisions on whether or not to construct such a device. This work will also provide an essential ingredient for any subsequent decisions on siting and the desirability of international collaboration in construction. This approach will result in a design for a device that is then available for all participants to use either in their own national program or as part of a larger international collaborative program.

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Furthermore, the United States proposes that research supportive of this design effort be coordinated and carried out under existing bilateral and multilateral arrangements among the participants. The United States believes that all participants need to coordinate their research activities to the greatest practical degree. This will ensure the most effective technical support to this challenging design activity which is basic to achieving an inexhaustible source of energy for all mankind.

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Background Information—Anticipated Effects of the Proposal on the European Community, the IAEA, Japan, and the United States

Effect on Foreign Participants

In order to distinguish this activity from the INTOR process, it is essential that participating nations arrive at one mutually acceptable design and perform the necessary supporting research in their domestic programs.

If accepted, the U.S. proposal would probably result in each nation devoting essentially its entire design capability to achievement of the common design. Since the proposal does not commit to a project or even to cooperation in the event of a project initiated by any party, it would be essential for each participant to maintain a strong domestic design team.

The work of their national teams would be coordinated, as in the INTOR process, by selected representatives meeting in Vienna to agree on common design decisions, common analyses, and other technical work to be conducted by the domestic teams. This type of design activity will result in identification of necessary supporting research tasks. The U.S. proposal is that these research tasks be coordinated and carried out through existing agreements between the participating nations. Since the EC and Japan already have full-scale design teams operating, no additional funds would be required on their part unless they wished to maintain a national design in parallel. With regard to supporting research, the EC has funded such work in its five-year plan and the Japanese tradition has been to do such work in advance of a project. Therefore, no significant international effort would be required for conducting the supporting research.

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Effect on the IAEA

As is currently the case with INTOR, the IAEA activity would be governed by a four party Steering Committee. The national representatives to the Steering Committee would be fully responsible for the design work and for coordinating their domestic activities supporting the common effort.

Existing IAEA staff would be responsible only for facilitating meetings and providing secretarial and editorial support as at present. Additional staff, if any, needed in Vienna due to an increased volume of technical activity would be provided by detailees from the parties. No funds would be provided to or be required from the IAEA for this activity beyond those currently involved in the INTOR workshop. It is expected that progress on this common work would be reported to the scientific community through published reports, ad hoc meetings, and at the biennial IAEA Plasma Physics and Controlled Fusion Conferences. This will ensure the broadest possible involvement of the world scientific community in the definition of the ETR.

Effect on US Fusion Program

Increased funds are required to carry out the work associated with the United States participation in the proposed initiative. Based on previous experience with the INTOR Workshop, it is possible to accurately project the appropriate level of increased funding within the U.S. The table below shows the increment over current activities which would be required for the effort to produce a useful technical result.

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Past experience of the EC, Japan, and the U.S. shows that a fully supported design team in the U.S. will require a total of about \$8M per year.

Therefore, additional resources to begin building the U.S. design activity to a level consistent with the proposed effort amount to two million dollars in 1987.

Much of the necessary supporting research has been identified by the past INTOR effort. However, no priorities or sharing of the necessary work have yet been negotiated. Typically the tasks involve use, or modest enhancements, of existing facilities to validate specific design assumptions. In advance of negotiations, the U.S. share of this supporting research within the domestic program can be estimated to total about \$8M in 1988 and \$12M in 1989. Therefore, incremental 1988 funds would be required to support both a full U.S. design team at the level of the EC and Japanese teams (\$2M), and our share of supporting research (\$8M). In 1989 an additional increment of \$4M for supporting research should be sufficient. Research beyond 1989 would depend on the degree of success in the prior research and the design activity but would probably not require a large increment.

This work should result in a detailed progress report at the 1988 IAEA Conference. A conceptual design report with completed supporting research can reasonably be expected by the 1990 IAEA Conference. This process will provide the basis for an analysis of technology transfer risks to support subsequent U.S. decisions on international collaboration with the Soviets.

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**U.S. Funding Requirements to Support the President's
Geneva Summit Fusion Initiative**

FY 1987**FY 1988****FY 1989**

Incremental Funds

for Design Team

\$ 2M

\$ 2M

Incremental Funds for

Supporting Research

\$ 8M

\$ 4M

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Action Plan — Tasks to be done in appropriate order

1. U.S. Ambassadors in Embassies of ^{Canada, EC, France, FRG, Italy, Japan and the U.K.} ~~Economic Summit Members~~ to present proposal at Ministers level to the Ministry responsible for the fusion program, Ministry of Foreign Affairs, and other officials (names to be supplied).
2. Ambassador Negroponte and Dr. Trivelpiece to brief Washington Science ^{Canada, EC, France, FRG, Italy, Japan and the U.K.} Counselors of ~~Economic Summit Members~~ and present U.S. proposal.
3. Cable to Soviets presenting U.S. proposal and asking for a meeting on November 15 and 16 in Tokyo.
4. Present copy of proposal to Soviet Washington Embassy Science Counselor.
5. Ambassador Kennedy speaks to IAEA Director General Blix.
6. Proposal and talking points to U.S. IAEA mission in Vienna.
7. Letter from A. W. Trivelpiece via cable to FWG Members to inform them directly.

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Talking Points for Discussion with Science Counselors of ~~the Economic~~

~~S. to H. S. S.~~ In Washington Japan, EC, Canada, United Kingdom, Germany, France, Italy ~~by~~

1. The U.S. ^{is proposing} ~~proposes~~ to discuss further details and our respective positions collectively at the Tokyo FWG meeting on November 11 and 12 before the bilateral meeting with the Soviets.
2. The U.S. is also proposing to the IAEA that this matter be discussed at the IAEA IFRC meeting on November 21.
3. The U.S. proposes to meet with representatives of the Soviet Union in Tokyo (November 15 and 16) to discuss this proposal.
4. The U.S. would like your reactions in order to prepare better for ^{these} ~~the~~ meetings.
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